Art. VII.—*Remarks on a Fluke Parasitic in the Copper-head Snake.*

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While on a botanical excursion to Oakleigh on 19th April last, in connection with the Field Naturalists' Club, and under the leadership of Mr. French, Government Entomologist, this specimen of copper-head snake was met with and killed on the spot.

On dissecting it a few hours later, for the purpose of studying the beating heart, numerous flukes were found in it of a still undetermined species. Professor Baldwin Spencer* gave a short account of a Pentastomum parasitic in the lung, before this Society, but I am not aware of any flukes having been hitherto recorded. In the lists of Ophidian Trematodes, as far as I am able to trace them, there is no mention of the copper-head snake as a host, so that the determination and description of this one will have to be given more fully afterwards. This fluke is apparently a common one, for on opening another copper-head snake, they were found to be abundant.

Occurrence.—They occupied the trachea and gullet in vast numbers, as well as the lung and anterior end of the stomach. Some of them were moving towards the mouth opening, and were thus free on the interior of the trachea or gullet, while others were adherent to the walls of these organs. A few were found in the mouth, evidently making their way out of the dead body.

It seems to be unusual to find flukes in both the alimentary and respiratory systems, as in none of the snakes to which I can find a reference is this the case. But here they are so numerous in both, that it is difficult to say

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which is most frequented. They seemed to ordinary inspection quite black, and as many of them were at least a quarter of an inch in length, there was no difficulty in seeing the oral and ventral suckers.

Habits.—As the specimens were numerous and all alive, I had plenty of opportunities of observing their habits. They were seen to move along in the interior of the semi-transparent stomach at a comparatively rapid rate, by extending the body its full length, then fixing the head sucker and contracting to the fullest extent. In this way a continuous progressive movement was kept up. The same movement was seen on placing them in a little water in a watch glass, from which they tried to escape, and the amount of alternate expansion and contraction displayed was considerable. They also sometimes moved to and fro in the water. Usually when taken from the body and placed in a little water, or water and glycerine, they discharged the dark-brown ova in successive jerks sufficient to discolour the water or mixture. Almost invariably when taken direct from the body, and placed in water on a slide under the microscope, they were observed to jerk out the ova with considerable force, from an opening adjacent to, and immediately behind the oral sucker. In its force and suddenness, the discharge seemed like a display of fireworks. In some instances, the brown ova were so completely ejected, as to render the body white-looking to the naked eye, while in others only a very partial discharge took place. It is very instructive to observe the eggs passing out of the body in Indian file, and this can be done leisurely. I placed a specimen on a slide, and a cover-glass over it, so that when gently pressed, a constant stream of ova flowed out, quicker or slower, according to the pressure, and as long as desired.

The ova discharged so near the mouth orifice would frequently fill it, then they would be sucked in and suddenly thrown out and scattered in all directions. Another movement frequently observed under the microscope, was that of apparent feeding. Every now and again, what seemed a long neck-like portion of the body would be stretched forward and the mouth opened at the same time, then the body would contract and the mouth-opening close.

They assumed all sorts of shapes and proportions in moving to and fro, well seen as they moved about on a moistened slide. In water they could remain alive for some time, for several hours at least.

General External Characters.—The flattened body is, as already stated, sometimes over a quarter of an inch in length when fully extended, but varies from that down to one-eighth of an inch, an average size being three-sixteenths of an inch. The tapering anterior and posterior ends are whitish, and the bulk of the body is of a dark-brown, tinged with red, due to the ova principally. The anterior extremity is somewhat rounded, and has the oral sucker on its ventral face. The posterior end is marked by a distinct, projecting, tail-like appendage, flattened out and rounded posteriorly. It is usually protruded, but may be so retracted as to be entirely hidden underneath. The posterior or ventral sucker is generally relatively smaller than the oral, and with the dark back-ground of the body at this place, often stands out with great distinctness. It is situated somewhat behind the middle of the body.

The surface of the body is covered with spines, generally directed outwards or backwards, and sometimes larger than usual on portions of the head end. Towards the posterior end, they are arranged in transverse rows, and curved, with the concave side anterior. Towards the anterior end they seem to be arranged in oblique rows. Usually, in flattened-out mounted specimens, there are no indications of the spines, while in others similarly mounted they stand out with great clearness.

Alimentary System.—The mouth is situated in the muscular head sucker, not in the centre of it, but towards the anterior end. Its natural shape is roundish, but may be transversely oval in mounted specimens. It leads into a pharynx, which very soon enlarges into a thickened muscular body, succeeded by a comparatively short gullet, which is thin-walled. The gullet divides into two branches, right and left—the forked intestine—which pass along either side of the body, and terminate not far from its posterior end. The termination may be club-shaped, or even elongated oval, according to the amount of distension.

Excretory System.—In specimens rendered very transparent by caustic potash, the median tube of the excretory system may be seen towards the posterior end of the body, where the reproductive organs do not conceal it. It enlarges considerably here, then tapers to a fine tube which, towards the very end of the body, may be seen to break up into delicate branches.

Reproductive System.—This is rather complicated, as is usual in hermaphrodite animals.

Male Organs.—The testes are two roundish, or oval, conspicuous, compact, sac-like bodies, on the right and left sides of the body, each inside and slightly anterior to the club-shaped termination of the intestine. Leading from each is a *vas deferens*, both of which pass close together on one side of the ventral sucker, and immediately in front of it merge into the vesicula seminalis. This is an elongated body, extending in an oblique direction, nearly to the hinder part of the oral sucker, where it terminates in a relatively large transversely oval opening. Sometimes the anterior end is protruded, and a glairy-looking mass discharged from the mouth which sticks together.

Female Organs.—These organs collectively form the most prominent feature in the body. The ovary is situated behind the ventral sucker, and the uterus filled with its ova having reddish-brown shell-cases, gives its colour to the bulk of the body. About two-thirds of the length of the body is occupied by it, and it opens at the anterior end just behind the oral sucker, and alongside the termination of the vesicula seminalis. The yolk-glands form numerous dark-grey clusters on either side of the body, extending from a little in front of the ventral sucker to near the posterior end of the body. Their numerous branching ducts unite to form a main duct on either side, and there unite in the middle line. The shell-gland from which the uterus arises, is situated a short distance behind the ventral sucker in the median line. It is a globular glandular mass. The ova are of an elongated oval shape, and the shell opens by a lid.

Details will be given in a future communication.